

Ecological Site Description—Rangeland

Shallow to Gravel, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East

MLRA: 60B – Pierre Shale Plains, East

R058AE191MT, R060BAE578MT

Site Name: Shallow to Gravel (SwG), 10–14 inches Mean Annual Precipitation (MAP)**Site Number:** R058AE191MT, R060BE578MT**Major Land Resource Areas:**
58A – Northern Rolling High Plains, North Part
60B – Pierre Shale Plains, North Part**Rangeland Resource Units:**
8AE – Sedimentary Plains, East
60BE – Pierre Shale Plains, East

1. Physiographic Features: This ecological site most often occurs on level, nearly level, and moderately steep alluvial fans, knolls, stream terraces, and terrace escarpments. Slopes range from 0–15%, but can occasionally occur on slopes greater than 15%. It also occurs on nearly level valley bottoms not subject to a water table or overflow events.

Elevation (feet): 1,900–3,500**Landform:** stream terrace, knoll, outwash plain, high flood plain steppe, terrace escarpment**Slope (percent):** 0–45, mainly less than 15**Depth to Water Table (inches):** greater than 60**Flooding:** none too rare**Ponding:** none**Runoff Class:** medium**Aspect:** not significant

2. Climatic Features: MLRAs 58A and 60B are considered to have a continental climate characterized by cold winters, hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are typical. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains and the winds move freely across the plains and account for rapid changes in temperature. Seasonal precipitation is often limiting for plant growth. Annual fluctuations in species composition and total production are typical depending on the amount and timing of rainfall. See Climatic Data Sheet MLRA 58A, east and 60B, for more details (Section II of the NRCS Field Office Technical Guide). For local climate station information, refer to <http://www.wcc.nrcs.usda.gov>.

Frost-free period (32° F)-days: 105–145**Freeze-free period (28° F)-days:** 125–170**Mean annual precipitation (inches):** 10–14

3. Influencing Water Features: None

4. Associated sites: Mainly Silty and Silty-Steep. It is also sometimes associated with Gravel or Clayey-Steep sites.

5. Similar sites: Silty, Shallow, Shallow Clay, Gravel.

The Silty site differs mainly by being over 20 inches deep to any root limiting material, including gravel.

The Shallow site is over hard rock or semi-consolidated beds, not gravels.

The Shallow Clay site differs by being clayey texture and underlain by shales.

The Gravel site will be very droughty, having a water holding capacity of less than 2 inches. It is very gravelly to within 10 inches of the surface.

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6. Soils: These soils are moderately deep to very deep. Depth to sand and gravel is typically 10 to 20 inches. Few roots penetrate beyond a depth of 20 inches. The upper 10–20 inches of the soil will typically have at least 20 to 35% less gravel than the lower part of the soil profile.

Parent material (kind): gravelly alluvium

Parent material (origin): mixed

Surface textures: silt loam, loam, sandy loam, fine sandy loam, and very fine sandy loam

Surface texture modifiers: gravelly

Subsurface Fragments \leq 3" (% volume): mainly 0–15 in the upper part (above 10–20 inches), increasing to over 35% below 10–20 inches.

Subsurface Fragments > 3" (% volume): 0–15

Depth (inches): >20

Soil surface permeability (inches per hour): mainly moderate (0.6–2.0)

Available Water Holding Capacity to 40" (inches): 2–4

Drainage Class: well to somewhat excessively

Salinity/Electrical Conductivity (mmhos/cm): non-saline (0–2)

Sodium Absorption Ratio (SAR): 0–5

Calcium Carbonate (CaCO₃) Equivalent: 0–15% in the upper part, generally above the gravels. There can be up to 30% CaCO₃ equivalent in a "transition" layer that is immediately above the gravel layer.

Reaction (pH) (1:1 water): neutral to moderately alkaline (6.6–8.4)

6a. Representative Soils: Listed below are soils and map units which characterize this site in various counties. (Reference MT-165, Soil Interpretive Rating Report).

COUNTIES	TYPICAL SOILS	MAP UNIT
Custer	Lilsheep gravelly loams	222D, 228F
Dawson	Beaverton loam & gravelly loam *	Tv, Tw, Ty, Bm
Garfield	Rivra loam, gravelly sandy loam	851A, 613A
McCone (54)	Lehr loam *	99
Prairie	Subwell loam *	116, 117, 118
Richland	Beaverton loam *	ToB
Treasure	Beaverton gravelly loam *	Bt
Wibaux	Beaverton gravelly loam *	Gd

* These soils are typically mapped in higher precipitation areas. However, because of the very limited extent of this ecological site in this MLRA/MLRU, they have been included here since these soil profiles represent the central concept of this site.

7. Plant Community and Species Composition: The physical aspect of this site in Historical Climax is that of a mixed grassland dominated by cool and warm season grasses and a mixture of forbs and shrubs. Approximately 70–80% of the annual production is from grasses and sedges, 10–15% from forbs, and 1–5% is from shrubs and half-shrubs. The canopy cover of shrubs is typically 5–10%.

TABLE 7a.—Major Plant Species Composition, lists plant species composition and production by dry weight for the Historic Climax (HCPC) or Potential Plant Community (PPC) for this site. The Historic Climax or Potential Plant community has been determined by the study of rangeland relict areas, enclosures, or areas protected from excessive grazing. Total annual production has been derived from several data sources, and has been adjusted to represent a typical annual moisture cycle for the site. Reference for plant species names and symbols: USDA–NRCS PLANTS Database at <http://plants.usda.gov>.

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R058AE191MT, R060BAE578MT

7a. Major Plant Species Composition – Historic Climax/Potential Plant Community

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (MAP) (inches)				
					10	11	12	13	14
					(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)	(lbs./acre)
Grasses and Sedges 70–80%					360	480	720	840	960
Bluebunch wheatgrass *	PSSP6	2	15-40		68-180	90-240	135-160	158-420	180-480
Little bluestem	ANSC10	1	5-15		22-68	30-90	45-135	52-158	60-180
Needleandthread	HECOC8	10	5-15		22-68	30-90	45-135	52-158	60-180
Sideoats grama	BOCU	3	5-10		22-45	30-60	45-90	52-105	60-120
Western or Thickspike wheatgrass	PASM ELLAL	14	5-10		22-45	30-60	45-90	52-105	60-120
Plains muhly	MUCU3	3	5-10		22-45	30-60	45-90	52-105	60-120
Threadleaf sedge	CAFI	12	1-5}	10	4-45 No more than 22 for any one	6-60 No more than 30 for any one	9-90 No more than 45 for any one	10-105 No more than 52 for any one	12-120 No more than 60 for any one
Sun sedge	CAHE5	4	1-5}						
Blue grama	BOGR2	15	1-5}						
Prairie junegrass	KOMA	12	1-5}						
Sandberg bluegrass	POSE	12	1-5}						
Plains reedgrass	CAMO	16	1-5}						
Prairie sandreed	CALO	5	1-5}						
Other native grasses	2GP		1-5}						
Red threeawn	ARPUL	11	0-T	T	T	T	T	T	T
Forbs 10–15%					68	90	135	158	180
Black samson	ECAN2	21	1-5}	15	4-68 No more than 22 for any one	6-90 No more than 30 for any one	9-135 No more than 45 for any one	10-158 No more than 52 for any one	12-180 No more than 60 for any one
Scurfpea spp.	PSORA2	23	0-5}						
Purple prairie clover	DAPU5	21	1-5}						
White prairie clover	DACA7	21	1-5}						
Hairy goldenaster	HEVI4	23	0-5}						
Dotted gayfeather	LIPU	21	1-5}						
American vetch	VIAM	32	1-5}						
Wild onion	ALLIU	32	0-5}						
Milkvetch spp.	ASTRA	24	0-5}						
Hood's phlox	PHHO	28	0-5}						
White milkwort	POAL4	23	0-5}						
American licorice	GLLE3	19	0-5}						
Green sagewort	ARDR4	19	0-5}						
Other native forbs	2FP		0-5}						
Death camas **	ZIGAD	32	0-T	T	T	T	T	T	T
Shrubs and Half-shrubs 1–5%					22	30	45	52	60
Prairie rose	ROAR3	38	0-5}	5	4-22	6-30	9-45	10-52	12-60
Silver sagebrush	ARCA13	36	0-5}						
Fringed sagewort	ARFR4	38	1-5}						
Skunkbush sumac	RHTR	33	1-5}						
Creeping juniper	JUHO22	38	0-5}						
Yucca	YUGL	37	0-5}						
Green rabbitbrush	CHVI8	36	0-5}						
Rubber rabbitbrush	ERNAN5	36	0-5}						
Wyoming big sagebrush	ARTRW8	37	0-5}						
Other native shrubs	2SB		0-5}						
Plains pricklypear	OPPO	38	0-T						
Broom snakeweed	GUSA2	37	0-T						
Total Annual Production (lbs./acre)			100%		450	600	900	1050	1200

* The percentage of this species tends to increase in the western part of this range resource unit.

** These species are poisonous to some grazing animals during at least some portion of their life cycle.

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7b. Plant Group Descriptions: Plant functional groups are based on: season of growth, growth form, stature, type of root system, and ecological response to disturbance. Refer to Field Office Technical Guide (FOTG) Section II for a complete description of plant groups.

8. Total Annual Production: Total annual production is a measurement of the total aboveground production (dry weight) of all major plant species that occur on the site during a single growth year, regardless of accessibility to grazing animals. This information is listed at the bottom of TABLE 7a.—Major Plant Species Composition. Average production values are listed for each incremental inch of precipitation for the site.

9. Cover and structure: The following table shows the approximate amounts of basal cover, canopy cover, and plant heights for this site in the Historic Climax or Potential Plant Community.

COVER TYPE	BASAL COVER (%)	CANOPY COVER (%)	AVERAGE HEIGHT (inches)
Cryptogams	0 – T	0 – T	0.25
Grasses/ sedges	5 – 10	20 – 30	24
Forbs	1 – 4	1 – 5	18
Shrubs	1 – 4	5 – 10	24
Litter	20 – 30		
Coarse fragments	0 – 5		
Bare ground	50 – 60		

10. Ecological Dynamics: This site developed under Northern Great Plains climatic conditions, which included the natural influence of large herbivores and occasional fire. The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC) or Potential Plant Community. This community is described as a reference to understand the original potential of this site, and is not always considered to be the management goal for every acre of rangeland. The following descriptions should enable the landowner or manager to better understand which plant communities occupy their land, and assist with setting goals for vegetation management. It can also be useful to understand the environmental and economic values of each plant community.

This site is considered moderately resilient to disturbance as it has only moderate soil limitations for plant growth. Changes may occur to the Historic Climax Plant Community due to management actions and/or climatic conditions. Under continued adverse impacts, a moderate decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments, this site can more readily return to the Historic Climax Plant Community (HCPC).

Continual adverse impacts to the site over a period of years results in a departure from the HCPC, with a decrease of the taller, more palatable species such as **bluebunch wheatgrass** and **little bluestem**. These plants will be replaced by **Western wheatgrass**, **needleandthread**, **threadleaf sedge**, **sand dropseed**, **blue grama**, **non-palatable forbs**, and **yucca**. Continued deterioration results in increased amounts of **green and fringed sagewort**, **red threeawn**, and **plains pricklypear**.

Plants that are not a part of the climax community that are most likely to invade are **Japanese brome**, **cheatgrass**, **six-weeks fescue**, **false buffalograss**, **broom snakeweed**, and **thistles**.

10a. Major Plant Community Types: Following are descriptions of several plant communities that may occupy this site.

Plant Community 1: Tall and Medium Grasses/ Forbs/ Shrubs (HCPC) or (PPC): This plant community contains a high diversity of tall and medium height grasses **bluebunch wheatgrass**, **little bluestem**, **western/thickspike wheatgrass**, and **needleandthread**, and short grasses and sedges (**plains muhly**, **prairie junegrass**, **Sandberg bluegrass**, **sun sedge**, **threadleaf sedge** and **blue grama**). There are abundant forbs, shrubs, and half-shrubs, including **skunkbush sumac**, **prairie rose**, **fringed safewort**, and **Wyoming big sagebrush**.

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R058AE191MT, R060BAE578MT

This plant community is well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Plants on this site have strong, healthy root systems that allow production to increase drastically with favorable precipitation. This plant community provides for soil stability and a functioning hydrologic cycle. Adequate plant litter is available for soil buildup and moisture retention.

Plant Community 2: Medium and Short Grasses/ Medium Shrubs: Slight variations in the Historic Climax or Potential plant community result in a community where the **western wheatgrass and needleandthread** become slightly more dominant, along with several of the short grasses. Forbs and shrubs such as **silver or Wyoming big sagebrush**, may also slightly increase.

Grass biomass production and litter become reduced on the site as the taller grasses disappear, increasing evapotranspiration and reducing moisture retention. Additional open space in the community can result in undesirable invader species. This plant community provides for moderate soil stability.

Plant Community 3: Medium and Short Grasses and Sedges/ Half-shrubs: With continued disturbance, the community becomes dominated by **needleandthread, short grasses and sedges such as threadleaf sedge, prairie junegrass, and blue grama**. Forbs and half-shrubs such as **green and fringed sagewort** begin comprising a larger part of the plant community.

This plant community is less productive than Plant Community 1 or 2. The lack of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and high evapotranspiration, which gives blue grama a competitive advantage over the cool season tall and medium grasses. This community has lost many of the attributes of a healthy rangeland, including good infiltration, minimal erosion and runoff, nutrient cycling and energy flow.

This community will respond positively to improved grazing management, but significant economic inputs and time would be required to move this plant community toward a higher successional stage and a more productive plant community.

Plant Community 4: Half-shrubs/ Short Grasses/ Cacti/ Annual Grasses and Forbs: If disturbance continues for a long enough period, with loss of topsoil and an increase of bare ground, the community will change to one dominated primarily by **short grasses and sedges**, shrubs such as **silver sagebrush, half-shrubs such as broom snakeweed and fringed sagewort, and annuals and biennials**. **Plains prickly pear** expands onto the site.

Once the community has reached this condition, it is very difficult to return to a community similar to the Historic Climax or Potential plant community without some major inputs, such as reseeding. This community has extremely reduced forage value for livestock and wildlife. Significant economic inputs and time would be required to move this plant community toward a higher successional stage and a more productive plant community. The potential for using seeding or mechanical treatment to improve site health is limited due to the shallow depth to sand and gravel.

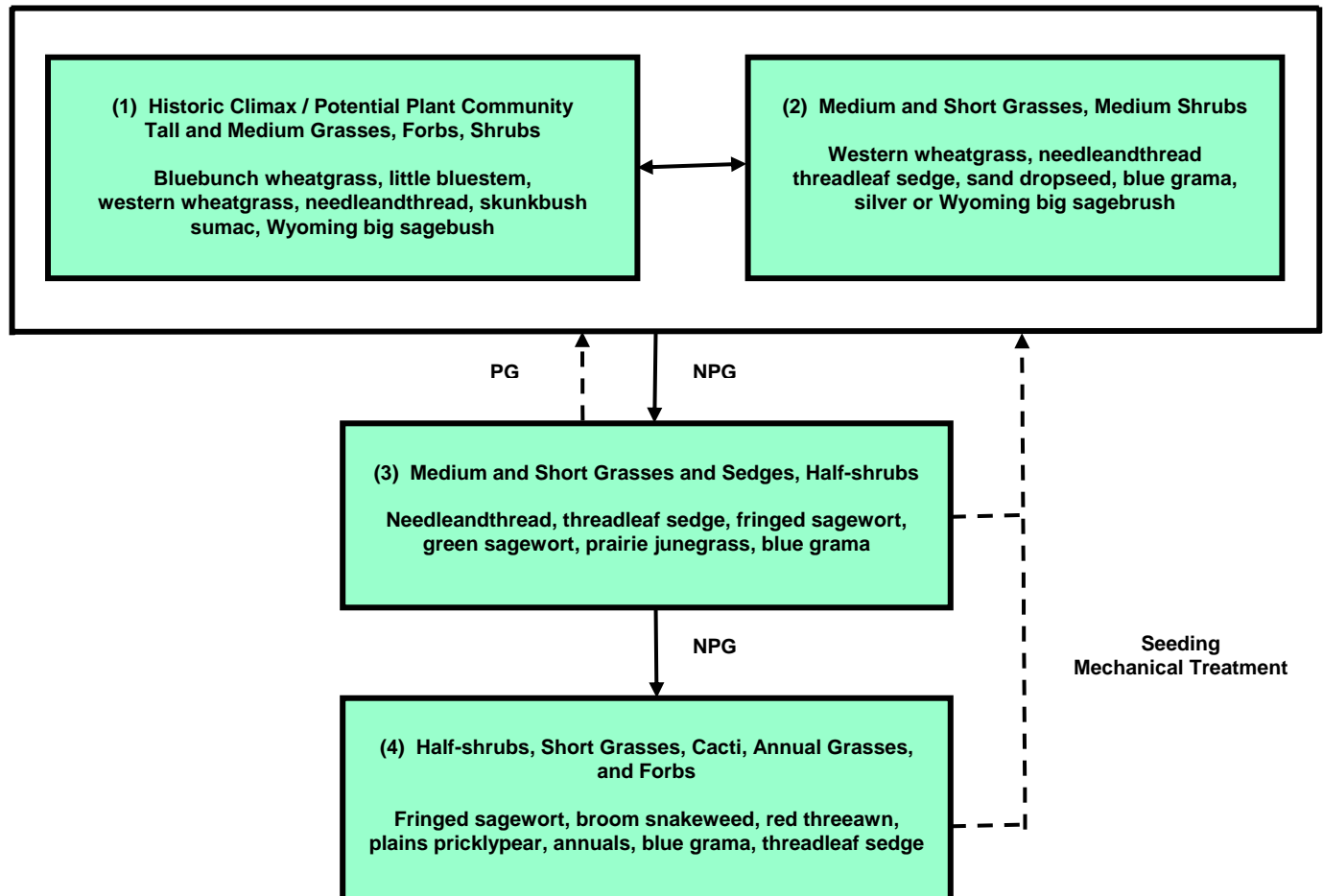
10b. Plant Communities and Transitional Pathways (State and Transition Model): Transitions in plant community composition occur along a gradient that is not linear. Many processes are involved in the changes from one community to another. Changes in climate, elevation, soils, landform, fire patterns and frequency, and grazing all play a role in determining which of the plant communities will be expressed. The following model outlines the various plant communities that may occur on this site and provides a diagram of the relationship between plant community and type of use or disturbance.

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Plant Communities and Transitional Pathways (diagram)



Smaller boxes within a larger box indicate that these communities will normally shift among themselves with slight variations in precipitation and other disturbances. Moving outside the larger box indicates the community has crossed a threshold (heavier line) and will require intensive treatment to return to Community 1 or 2. Dotted lines indicate a reduced probability for success.

NOTE: Not all species present in the community are listed in this table. Species listed are representative of the plant functional groups that occur in the community.

PG = Prescribed Grazing: Use of a planned grazing strategy to balance animal forage demand with available forage resources. Timing, duration, and frequency of grazing are controlled and some type of grazing rotation is applied to allow for plant recovery following grazing.

NPG = Non-Prescribed Grazing: Grazing which has taken place that does not control the factors as listed above, or animal forage demand is higher than the available forage supply.

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11. Plant Growth Curves: Growth of native cool-season plants begins in April and continues to the end of June. Native warm-season plants begin growth about mid May and continue to about the end of August. Green up of cool-season plants can occur in September through October when adequate soil moisture is present. The following tables show the approximate percentage of total growth by month that is expected to occur in various plant communities on this site for a "typical" moisture year.

Growth Curve Number: MT0811

Growth Curve Description: Includes all eastern sedimentary plains sites in the 10 – 14" p.z. with droughty upland soils, having mainly cool season plants.

Totals for Each Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	5	25	35	30	5	0	0	0	0	0

Cumulative Totals by Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	5	30	65	95	100	0	0	0	0	0

Growth Curve Number: MT0813

Growth Curve Description: Includes all low condition sites in eastern sedimentary plains sites, dominated by short grasses.

Totals for Each Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	25	25	25	10	10	5	0	0	0

Cumulative Totals by Month

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	25	50	75	85	95	100	0	0	0

12. Livestock Grazing Interpretations: Managed livestock grazing is suitable on this site as it has the potential to produce a moderate amount of high quality forage. Forage production may be somewhat limited on sites with steep slopes where the potential for runoff is high, reducing the effectiveness of the precipitation received for plant growth. The steeper slopes may also limit livestock travel and result in poor grazing distribution, especially in areas away from water. Management objectives should include maintenance or improvement of the plant community. Shorter grazing periods and adequate re-growth after grazing are recommended for plant maintenance and recovery. Heavy stocking and season long use of this site can be detrimental and will alter the plant community composition and production over time.

Whenever Plant Community 2 (medium and short grasses) occurs, grazing management strategies need to be implemented to avoid further deterioration. This community is still stable, productive, and healthy provided it receives proper management. This community will respond fairly quickly to improved grazing management including increased growing season rest of key forage plants. Grazing management alone can usually move this community back to one more similar to potential if a good seed source of the taller grasses still exists.

Plant Community 3 or 4 have extremely reduced forage value for livestock and wildlife. Once this site is occupied by these communities, it will be more difficult to restore it to a community that resembles the potential with grazing management alone. Additional growing season rest is often necessary for re-establishment of the desired species and to restore the stability and health of the site.

The potential for using seeding and/or mechanical treatment to improve site health is limited due to the shallow depth to sand and gravel.

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12a. Calculating Safe Stocking Rates: Proper stocking rates should be incorporated into a grazing management strategy that protects the resource, maintains or improves rangeland health, and is consistent with management objectives. Safe stocking rates will be based on useable forage production, and should consider ecological condition and trend of the site, and past grazing use history.

Calculations used to determine a safe stocking rate are based on the amount of useable forage available, taking into account the harvest efficiency of the animal and the grazing strategy to be implemented. Average annual production must be measured or estimated to properly assess useable forage production and stocking rates.

12b. Guide to Safe Stocking Rates: The following charts provide a guide for determining a safe stocking rate. Animal Unit Month (AUM) figures are based on averages of forage production from data collected for this site over several years. The characteristic plant communities and production values listed may not accurately reflect the productivity of a specific piece of land, hence this table should not be used without on-site information as to current forage productivity of the site. Adjustments to stocking rates for each range unit must be made based on topography, slope, distance to livestock water, and other factors, which effect livestock grazing behavior.

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MLRA: 60B – Pierre Shale Plains, East
R058AE191MT, R060BAE578MT

12c. Stocking Rate Guide:

Major Plant Community Dominant Plant Species	MAP	Total Production (pounds/ac)	Cattle			Sheep		
			Forage Production	AUM/ac	Ac/AUM	Forage Production	AUM/ac	Ac/AUM
1. Tall and Medium Grasses, Forbs, Shrubs (HCPC/PPC) <i>Bluebunch wheatgrass, little bluestem western wheatgrass, needleandthread</i> (S.I. >70%)	13–14"	1050–1200	900 – 1000	.28 – .32	3.1–3.6	950 – 1100	.30 – .35	2.9–3.3
	10–12"	450 – 900	400 – 750	.13 – .24	4.2–7.7	400 – 800	.13 – .25	4.0–7.7
2. Medium and Short Grasses, Medium Shrubs <i>Western wheatgrass, needleandthread, threadleaf sedge, sand dropseed, blue grama, silver sagebrush</i> (S.I. 50–70%)	13–14"	900 – 1050	675 – 900	.21 – .28	3.6–4.8	700 – 950	.22 – .30	3.3–4.5
	10–12"	400 – 800	300 – 700	.09 – .22	4.5–11.1	300 – 700	.09 – .22	4.5–11.1
3. Medium and Short Grasses and Sedges, Half-shrubs <i>Needleandthread, threadleaf sedge, fringed and green sagewort, prairie junegrass, blue grama</i> (S.I. 30–50%)	10–14"	350 – 900	200 – 600	.06 – .19	5.3–16.7	250 – 700	.08 – .22	4.5–12.5
4. Half-shrubs, Short Grasses, Cacti, Annuals <i>Fringed and green sagewort, broom snakeweed, red threeawn, plains pricklypear, annuals</i> (S.I. <30%)	10–14"	250 – 600	100 – 350	.02 – .08	12.5–50	150 – 400	.03 – .09	11.1–33.3

Stocking rates are calculated from average forage production values using a 25% Harvest Efficiency factor for preferred and desirable plants, and 10% Harvest Efficiency for less desirable species. AUM calculations are based on 790 pounds per animal unit month (AUM) for a 1,000-pound cow with calf up to 4 months. No adjustments have been made for site grazability factors, such as steep slopes, site inaccessibility, or distance to drinking water.

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12d. Plant Forage Preferences for Cattle and Sheep

Legend: P=Preferred D=Desirable U=Undesirable E=Emergency
N=Nonconsumed T=Toxic Blank=Unknown or no data

Winter (W) = Jan., Feb., March;
Summer (SU) = July, Aug., Sept.;

Spring (SP) = April, May, June;
Fall (F) = Oct., Nov., Dec.

PLANT NAME	Cattle				Sheep			
	W	SP	SU	F	W	SP	SU	F
Bluebunch wheatgrass	P	D	P	P	D	D	D	D
Western wheatgrass	P	D	D	P	D	D	D	D
Thickspike wheatgrass	P	P	P	P	P	P	P	P
Little bluestem	P	P	P	P	U	D	D	U
Sideoats grama	P	P	P	P	D	D	P	D
Needleandthread ^{1/}	D	D	D	D,T	D	D	D	D
Sandberg bluegrass	D	D	D	D	D	D	D	D
Threadleaf and Needleleaf sedge	D	P	P	D	D	P	P	D
Sun sedge	D	P	D	P	D	P	P	D
Prairie junegrass	D	D	D	D	D	P	D	D
Plains muhly	D	D	D	D	D	D	D	D
Prairie sandreed	D	D	D	D	D	D	D	D
Blue grama	D	D	D	D	D	P	P	D
Plains reedgrass	D	D	D	D	U	U	U	U
Red threeawn	N	U	N	N	N	U	N	N
Cheatgrass ^{2/}	U	D	N	N	U	P	U	U
Black samson	N	D	D	D	D	P	P	D
Prairieclover spp.	N	D	D	D	D	D	D	D
Dotted gayfeather	N	P	P	P	D	P	D	D
Milkvetch spp. ^{3/}	N	D,T	D,T	D,T	D,T	P,T	D,T	D,T
American vetch	N	P	P	D	N	P	P	D
Scurfpea spp.	N	N	N	N	N	D	U	N
Wild onion	N	P	P	N	N	P	P	N
Hood's phlox	N	N	N	N	U	U	U	U
Hairy goldenaster	N	N	N	N	N,E	U	N,E	N,E
White milkwort	N	N	N	N	N	U	N	N
Green sagewort	N	N	N	N	N	N	N	N
American licorice	N	N	N	N	N	D	D	N
Death camas	N	T	T	N	N	T	T	N
Prairie rose	N	N	N	N	D	D	D	D
Silver sagebrush	D	D	D	D	D	D	D	D
Green and rubber rabbitbrush	U	U	U	U	U	U	U	U
Wyoming big sagebrush	N	N	N	N	P	D	D	P
Skunkbush sumac	N	N	N	N	U	U	U	U
Creeping juniper	N	N	N	N	N	N	N	N
Fringed sagewort	N	N	N	N	U	U	U	U
Yucca	N	N	N	N	U	D	D	U
Broom snakeweed ^{4/}	N	N	N	U	U	U	U	U
Plains pricklypear ^{5/}	N	N	N	N	U	U	U	U

^{1/} The awns and sharp seeds of needleandthread can harm livestock when dry.

^{2/} Not a native plant, but a common invader.

^{3/} Some species of milkvetch are poisonous.

^{4/} Broom snakeweed can be poisonous, but this is not usually a problem in Montana because plants die back in winter and do not have green leaves in early spring.

^{5/} The spines can be injurious to livestock.

Ecological Site Description—Rangeland

Shallow to Gravel, 10–14" MAP

MLRA: 58A – Sedimentary Plains, East
MLRA: 60B – Pierre Shale Plains, East
R058AE191MT, R060BAE578MT

13. Wildlife Interpretations: The following is a description of habitat values for the different plant communities that may occupy the site:

Plant Community 1: Tall and Medium Grasses/ Forbs/ Shrubs (HCPC or PPC): The predominance of grasses plus a diversity of forbs, shrubs and half-shrubs in this community favors grazers and mixed feeders such as bison, pronghorn and elk. Warm season grasses extend the availability of nutritious forage for grazers. Large animal nutrition levels are relatively high yearlong because of the diversity of plant life forms and seasonality. Complex plant structural diversity provides habitat for a variety of small mammals (mainly seedeaters, i.e. deer mice) and neotropical migratory birds. The diversity of grass life forms and heights, along with scattered shrubs and a variety of forbs, provides habitat for many bird species including the long-billed curlew, vesper sparrow, and western meadowlark. Residual grass and litter cover provide nesting habitat for a number of bird species, particularly those favoring somewhat sparser cover than is available on deep soils.

Plant Community 2: Medium and Short Grasses/ Medium Shrubs: Some loss of litter and residual grass cover degrades ground-nesting bird habitat somewhat. A more open ground cover may provide lek sites for sage grouse, if large expanses of sagebrush-grassland are nearby. The loss of warm season grasses shortens the green feed period for grazers and mixed feeders. Pronghorn and mule deer may forage on abundant forbs and shrubs/half-shrubs.

Plant Community 3: Medium and Short Grasses and Sedges/ Half-shrubs: A general loss of plant species diversity, litter and residual cover reduce wildlife habitat value considerably. Ground-nesting bird habitat suffers from a lack of cover. Sage grouse may find lek sites here if the community is adjacent to large blocks of sagebrush-grassland. Other bird species such as mountain plovers and long-billed curlews may nest in the sparse cover. Small mammal species composition is simplified, mainly consisting of deer mice. Selective feeders, such as mule deer and pronghorn forage on forbs and shrubs/half-shrubs.

Plant Community 4: Half-shrubs/ Short Grasses/ Cacti/ Annuals: Wildlife habitat value is generally quite low. Bird species favoring sparse cover, including mountain plovers and McCown's longspurs may nest in this community. Seed production from annuals and scattered perennial grasses and forbs will support some deer mice.

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13a. Plant Preferences for Antelope and Deer:

Legend: P=Preferred D=Desirable U=Undesirable E=Emergency
N=Nonconsumed T=Toxic Blank=Unknown or no data

Winter (W) = Jan., Feb., March; Spring (SP) = April, May, June;
Summer (SU) = July, Aug., Sept.; Fall (F) = Oct., Nov., Dec.

PLANT NAME	Antelope				Deer			
	W	SP	SU	F	W	SP	SU	F
Perennial grasses	P	P	P	P	D	P,D	D	D
Red threeawn	N	N	N	N	N	N	N	N
Annual grasses	N	P,D	N	D	N	P,D	N	D
Sedges	D	P	P	P	D	P	P	P
Black samson	P	P	P	P	D	D	D	D
Prairieclover spp.	P	P	P	P	P	P	P	P
Dotted gayfeather	D	P	D	D	D	P	P	P
Milkvetch spp.	D	P	P	D	D	D	D	D
Scurfpea spp.	N	D	D	D	D	D	D	D
Hairy goldenaster	E	E	E	E	E	E	E	E
White milkwort	N, E	N, E	N, E	N, E	N, E	N, E	N, E	N, E
American licorice	P	P	D	D	D	P	D	D
American vetch	P	P	P	P	D	P	P	P
Hood's phlox	U	U	U	U	U	U	U	U
Green sagewort	N	N	N	N	N	N	N	N
Death camas	N, T	N, T	N, T	N, T	N, T	N, T	N, T	N, T
Skunkbush sumac	E	E	E	E	P	P	D	P
Prairie rose	U	U	U	U	E	D	E	E
Silver sagebrush	D	D	P	D	P	P	D	P
Wyoming big sagebrush	P	P	P	P	P	P	D	D
Rabbitbrush spp.	D	D	D	D	D	D	D	D
Creeping juniper	N	N	N	N	D	D	D	D
Yucca	N	N	N	N	N	N	N	N
Fringed sagewort	D	U	U	D	D	U	U	D
Plains pricklypear	N	N	N	N	N	N	N	N
Broom snakeweed	N	N	D	N	D	D	P	P

14. Hydrology Data: The soils associated with this ecological site are generally in Hydrologic Soil Group B. The infiltration rates for these soils will normally be moderate. The runoff potential for this site is moderate, depending on slope and ground cover/health. Runoff curve numbers generally range from 76 to 94.

Good hydrologic conditions exist on rangelands if plant cover (grass, litter, and brush canopy) is greater than 70%. Fair conditions exist when cover is between 30 and 70%, and poor conditions exist when cover is less than 30%. Sites in high similarity to HCPC (Plant Communities 1 and 2) generally have enough plant cover and litter to optimize infiltration, minimize runoff and erosion, and have a good hydrologic condition. The deep root systems of the potential vegetation help maintain or increase infiltration rates and reduce runoff.

Sites in low similarity (Plant Communities 3 and 4) are generally considered to be in poor hydrologic condition as the majority of plant cover is from shallow-rooted species such as blue grama and annual grasses, and half-shrubs.

Erosion is minor for sites in high similarity. Rills and gullies should not be present. Water flow patterns, if present, will be barely observable. Plant pedestals are essentially non-existent. Plant litter remains in place and is not moved by erosion. Soil surfaces should not be compacted or crusted. Plant cover and litter helps retain soil moisture for use by the plants. Maintaining a healthy stand of perennial vegetation will optimize the amount of precipitation that is received. (Reference: Engineering Field Manual, Chapter 2 and Montana Supplement 4).

Ecological Site Description—Rangeland

Shallow to Gravel, 10–14" MAP

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15. Recreation and Natural Beauty: This site provides recreational opportunities for big game and upland bird hunting, and hiking. The forbs have flowers that appeal to photographers. This site provides valuable open space and visual aesthetics.

16. Wood Products: None

17. Site Documentation:

Authors: Original: REL, AJN, 1983 Revised: JVF, REL, RSN, MJR, SKW, SVF, POH, 2003

Supporting Data for Site Development:

NRCS–Production & Composition Record for Native Grazing Lands (Range-417): 13

BLM–Soil & Vegetation Inventory Method (SVIM) Data: 6

NRCS–Range Condition Record (ECS-2): 30

NRCS–Range/Soil Correlation Observations & Soil 232 notes: 14

Field Offices where this site occurs within the state:

Baker
Billings
Broadus
Circle

Ekalaka
Forsyth
Glendive
Hardin

Hysham
Jordan
Miles City
Roundup

Sidney
Terry
Wibaux

Site Approval: This site has been reviewed and approved for use:

Rhonda Sue Noggles
State Rangeland Management Specialist

06/30/03
Date

Ecological Site Description—Rangeland

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**Shallow to Gravel 10–14"
Sedimentary Plains, east
Plant Community 2**



**Shallow to Gravel 10–14"
Sedimentary Plains, east
Plant Community 2
Prairie County**



**Shallow to Gravel 10–14"
Sedimentary Plains, east
Plant Community 3**

Ecological Site Description—Rangeland

Shallow to Gravel, 10–14" MAP

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Shallow to Gravel 10–14"
Sedimentary Plains, east
Plant Community 3
Prairie County